

United States Environmental Protection Agency Washington, DC 20460				Work Assignment Number: <b>1-18</b> <input checked="" type="radio"/> Original Amendment			
<b>Work Assignment</b>							
Contract Number: EP-C-09-027		Contract Period Base: Option Period No. 1		SF Site Name:			
Title of Work Assignment: PFOA Article Testing							
Suggested Source: Arcadis				Specify Section & Paragraph of Contract SOW: 2.0, 4.0, and 5.1			
Purpose: <input checked="" type="radio"/> Work Assignment Initiation      Work Assignment Close-Out: <input type="radio"/> Work Assignment Amendment      Incremental Funding <input type="radio"/> Work Plan Approval				Period of Performance From: 04/01/2010 To: 03/31/2011			
Comments:  Program: SP2 (Safe Pesticides/Safe Products) OMIS No. 22100 Previous Contract No.: EP-C-09-027 Previous WA No.: 0-18				OA Category (check one) <input type="radio"/> I Enforcement <input checked="" type="radio"/> II Standard Setting <input type="radio"/> III Technology Development <input type="radio"/> IV Proof of Concept <input type="radio"/> N/A			
Note: To report additional accounting and appropriations data use EPA Form 1900-69A.							
SFO 22      Superfund (Max 2)		<b>Accounting and Appropriations Data</b>				Non-Superfund	
DCN (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount	Sites/Project (Max 8)
1							
2							
3							
4							
5							
<b>Authorized Work Assignment Ceiling</b>							
Contract Period:				Cost/Fee		LOE	
Previously Approved				New		0	
This Action						0	
Total						0	
<b>Work Plan / Cost Estimate Approvals</b>							
Contractor WP Dated:				Cost/Fee:		LOE:	
Cumulative Approved:				Cost/Fee:		LOE:	
Work Assignment Manager Name    Zhishi Guo <i>Zhishi Guo</i> 2/10/2010 (Signature)      (Date)				Branch / Mail Code    IEMB / E305-03 Phone Number    (919) 541-0185 Fax Number    919-541-2157			
Branch Chief Name    Robert C. Thompson, Chief, IEMB <i>Robert C. Thompson</i> 2/10/2010 (Signature)      (Date)				Branch/Mail Code    IEMB / E305-03 Phone Number    919-541-1904 Fax Number    919-541-2157			
Project Officer Name    Diane Pierce <i>Diane L. Pierce</i> 2/16/10 (Signature)      (Date)				Branch/Mail Code    TSB / E343-03 Phone Number    (919) 541-2708 Fax Number    919-541-0496			
Contracting Official Name    Renita Tyus, CO <i>Renita Tyus</i> 3/2/10 (Signature)      (Date)				Branch/Mail Code    CPOD Phone Number    (513) 487-2094 Fax Number    (513) 487-2109			
Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)						Date	

Work shall not begin on this work assignment until 04/01/10.

## **Statement of Work**

### **PFOA Aged Article Testing (Phase II)**

#### **I. Background and Objective**

Perfluorooctanoic acid (PFOA) is a surfactant associated with fluoropolymer and fluorotelomer products, and can cause developmental and other adverse effects in laboratory animals. It has been found at very low levels both in the environment and in the blood of the general U.S. population. Investigators have recently reported that PFOA concentrations in indoor air are much higher than those in ambient air. This finding suggests that some consumer products may be major PFOA sources in the indoor environment, and that indoor exposure (e.g., inhalation of dusts and dermal contact with consumer products) may constitute a significant portion of the total exposure to PFOA among the general population. It is known that a wide range of consumer products, also known as articles of commerce (AOCs) may contain PFOA. For instance, according to a recent study, one square meter of carpet treated with fluorotelomer-based stain repellent solutions may contain several hundred micrograms of PFOA. However, the role of these common consumer products on human exposure remains unclear, and there is no information on the release of PFOA during the life cycle of AOCs. EPA's Office of Pollution Prevention and Toxic (OPPT) is currently evaluating the potential health risks associated with PFOA and its analogues. This project – PFOA aged article testing – supports OPPT's data needs by: (1) characterizing the source, transport, and fate of PFOA in the indoor environment, (2) characterizing the factors that may affect PFOA release from consumer products, and (3) examining risk management options for reducing human exposure to PFOA.

Under this WA, the Contractor shall provide technical support to the Government by collecting AOC samples from the U.S. open market for long-term monitoring of the market trends for PFC content and conducting experiments in the EPA Test House to evaluate the carpet cleaning methods for their effectiveness in removing PFCs from treated carpet.

#### **II. Scope of Work**

##### **Task 1. Procure AOC Samples for Long-term Monitoring Market Trend**

The Contractor shall procure AOC samples from the open market twice during the performance period of this WA. The first round shall be in the spring of 2010 and the second round in late 2010 through early 2011. For each round of sample collection, a minimum of 30 samples shall be

collected according to the technical direction of the WAM. The Contractor shall fully document sample information by using computer program STRACK-II provided by the Government. The Contractor shall be responsible for sample storage, preparation of sub-samples (coupons and aliquots), and transfer sub-samples to the WAM by using the chain-of-custody form in program STRACK-II. The scope of sample collection is summarized in Table 1.

Table 1. AOC samples to be collected for each time point

Category No.	Category Name	# Analyzed in Phase I	# Analyzed in Phase II	Comments
A	Carpet	9	7	[1]
B	Commercial Carpet Care	7	7	[2]
C	Household Carpet Care	12	6	[1]
D	Treated Apparel	16	4	[3]
E	Textiles	14	3	[4]
F	Non-woven medical garments	5	2	[4]
G	Wax	11	8	[2] (limited to 8)
H	Food packaging	5	5	[2]
I	Membranes	10	3	[4]
J	Tape	10	2	[4]
K	Cookware	15	0	[5]
L	Floss	8	2	[6]
M	Miscellaneous	7	0	[5]

[1] Representative samples of the most widely used treated carpets and carpet care products.

[2] Collect all products that are still on the market from Phase I.

[3] School uniforms and products still on the market from Phase I.

[4] Collect three highest from Phase I.

[5] Not studied in Phase II.

[6] Collect two highest from Phase I.

Because of the rapidly changing market, some AOCs that were analyzed in Phase I may no longer be available. The following criteria will be used for sample collection:

- Within each AOC category, samples of the same brands, manufacturers, and vendors as in Phase I will be collected whenever possible.
- Priorities are given to AOCs with high PFC content as determined in Phase I (see Guo, et al; 2009)
- For certain sample categories, such as mill-treated carpeting, the perfluorochemical products have reformulated and the same AOC samples collected in Phase I are no longer

available. In such cases, representative samples of the most widely used AOCs will be collected.

- Product categories with low PFC content (e.g., non-stick cookware) will not be monitored.
- Domestic and imported AOCs will be monitored.

#### Task 2. Conduct Tests in EPA Test House to Evaluate the Effectiveness of Removing PFCs from Treated Carpeting by Using Hot-water Extraction and Steam Cleaning

The contractor shall conduct experiments in the test house to determine the effectiveness of removing PFCs from treated carpeting by using hot-water extraction and steam cleaning by following the QAPP entitled *Quality Assurances Project Plan (QAPP) for Evaluation of PFAA Release from Articles of Commerce (AOCs) — Phase II: Market Monitoring of PFAA Content in New AOCs and Evaluation of Carpet-Care Liquids and Cleaning Method*. A brief description of the test method is described below.

Tests will be conducted in the EPA Test House located in Cary, NC. Two rooms of the EPA test house will be used for this component of Task II. The first room will be carpeted in a standard industrial carpet that is determined to have low PFAA levels (concentrations below the instrument quantification limit for a 2 gram carpet sample for compounds with a molecular weight equal to greater than perfluoropentanoic acid.) The second will use a representative residential carpet similarly low in PFAAs. A scouting test will be performed initially to finalize the test procedure before starting the designed experiments. Two experiments using one of two PFAA-containing stain resistant treatments formulated for commercial use will be carried out with the industrial carpet. Two similar stain treatments for residential use will be applied to the residential carpet. Three rounds of carpet cleaning, using either a residential or professional carpet cleaning machine will be studied to determine the efficiency of the carpet cleaning methods to remove the PFAAs from the stain-resistant treatments. This is summarized in Tables 2 and 3.

Table 2. Experimental design for testing of carpet care treatments

Carpet Type	PFAA-containing Stain-resistant Carpet Treatment	Cleaning Method
Commercial	1	Residential Hot Water Extraction
Commercial	1	Professional Steam Cleaning
Commercial	2	Residential Hot Water Extraction
Commercial	2	Professional Steam Cleaning
Residential	1	Residential Hot Water Extraction
Residential	1	Professional Steam Cleaning
Residential	2	Residential Hot Water Extraction
Residential	2	Professional Steam Cleaning

Table 3. Experimental sampling schedule for testing of carpet care treatments

Stage	Samples Collected
Prior to Treatment Application	5
Post-Treatment Application	5
Post-cleaning, Round 1	5
Post-cleaning, Round 2	5
Post-cleaning, Round 3	5

The contractor (ARCADIS) shall monitor the purchase and installation of the carpets, the purchase and application of the carpet treatments, and perform or oversee the cleaning of the carpets. Additionally, the contractor shall collect the carpet samples and monitor the environmental condition (temperature, relative humidity, and air exchange rate (ach)) of the test house.

### **III. QA/QC**

The Contractor shall provide technical support for this project by following *Quality Assurances Project Plan (QAPP) for Evaluation of PFAA Release from Articles of Commerce (AOCs) — Phase II: Market Monitoring of PFAA Content in New AOCs and Evaluation of Carpet-Care Liquids and Cleaning Methods* and approved SOPs.

The contractor shall adhere to the QA requirements as delineated in Attachment #1 to the Statement of Work.

### **IV. Acceptance Criteria and Management Controls**

The Contractor shall either submit to the WAM a project status report every two weeks or, alternatively, report the status orally at the bi-weekly team meeting.

The Contractor shall alert the WAM in advance when it expects a substantial delay in completing the task or submitting the deliverable.

### **V. Deliverables**

1. The Contractor shall create and maintain all sample records by using computer program STRACK-II located in the scientific data share \NRMRL\_Guo2. The complete sample records for this performance period are due March 15, 2011.
2. The Contractor shall submit a summary report on sample collection method and results for long-term monitoring, due December 31, 2010. The summary report shall be submitted in microsoft word.
3. The Contractor shall submit the Test Summary Data Sheets (in Microsoft Excel) within two weeks after a test is completed. The data shall include preliminary data quality review.

### **VI. Personnel**

It is recommended that this Work Assignment be lead by a scientist or engineer with experience in testing product emissions and operating small environmental chambers.

### **VII. Work Assignment Manager Designation**

The Work Assignment Manager is:

Dr. Zhishi Guo  
U.S. Environmental Protection Agency  
National Risk Management Research Laboratory

Air Pollution Prevention and Control Division  
Indoor Environment Management Branch  
Mail Code E305-03  
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#### **VIII. Work Assignment Duration**

The period of performance for this work assignment is from the date this work assignment is issued through March 31, 2010.

## ATTACHMENT #1 TO STATEMENT OF WORK FOR QA CATEGORY II PROJECTS

### NRMRL QA Requirements and Definitions

In accordance with EPA Order 5360.1 A2, conformance to ANSI/ASQC E4 must be demonstrated by submitting the quality documentation described herein. All quality documentation shall be submitted to the Government for review. The Government will review and return the quality documentation, with comments, and indicate approval or disapproval. If the quality documentation is not approved, it must be revised to address all comments and shall be resubmitted to the Government for approval. Work involving environmental data collection, generation, use, or reporting shall not commence until the Government has approved the quality documentation. The QAPP shall be submitted to the Government at least thirty (30) days prior to the beginning of any environmental data gathering or generation activity in order to allow sufficient time for review and revisions to be completed. After the Government has approved the quality documentation, the Contractor shall also implement it as written and approved by the Government.

#### **Definitions:**

**Environmental Data** - These are any measurements or information that describe environmental processes, location, or conditions; ecological or health effects and consequences; or the performance of environmental technology. For EPA, environmental data include information collected directly from measurements, produced from software and models, and compiled from other sources such as data bases or the literature.

**Quality Assurance (QA)** - Quality assurance is a system of management activities to ensure that a process, item, or service is of the type and quality needed by the customer. It deals with setting policy and running an administrative system of management controls that cover planning, implementation, and review of data collection activities and the use of data in decision making. Quality assurance is just one part of a quality system.

**Quality Assurance Project Plan (QAPP)** - A QAPP is a document that describes the necessary quality assurance, quality control, and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance criteria. A QAPP documents project-specific information.

**Quality Control (QC)** - Quality control is a technical function that includes all the scientific precautions, such as calibrations and duplications, that are needed to acquire data of known and adequate quality.

**Quality Management Plan (QMP)** - A QMP is a document that describes an organization's/program's quality system in terms of the organizational structure, policy and procedures, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, documenting, and assessing all activities conducted. A QMP documents the overall organization/program, and is primarily applicable to multi-year, multi-project efforts. An organization's/program's QMP shall address all elements listed in the Requirements for Quality Management Plans in Appendix B of the NRMRL QMP.

**Quality System** - A quality system is the means by which an organization manages its quality aspects in a systematic, organized manner and provides a framework for planning, implementing, and assessing work performed by an organization and for carrying out required quality assurance and quality control activities.

**R-2** - EPA Requirements for Quality Management Plans (EPA/240/B-01/002) March, 2001,  
<http://www.epa.gov/quality/qs-docs/r2-final.pdf>

**R-5** - EPA Requirements for QA Project Plans (EPA/240/B-01/003) March, 2001  
<http://www.epa.gov/quality/qs-docs/r5-final.pdf>

**Substantive Change** - Substantive change is any change in an activity that may alter the quality of data being used, generated, or gathered.

**EPA=s Quality System Website:** <http://www.epa.gov/quality/>

**EPA=s Requirements and Guidance Documents:** [http://www.epa.gov/quality/qa\\_docs.html](http://www.epa.gov/quality/qa_docs.html)

**□ NRMRL=s Quality System Specifications:**

- (1) a description of the organization=s Quality System (QS) and information regarding how this QS is documented, communicated and implemented;
- (2) an organizational chart showing the position of the QA function;
- (3) delineation of the authority and responsibilities of the QA function;
- (4) the background and experience of the QA personnel who will be assigned to the project; and
- (5) the organization=s general approach for accomplishing the QA specifications in the SOW.

**Category Level Designations (determines the level of QA required):**

- ☐ **Category I Project** - applicable to studies performed to generate data used for enforcement activities, litigation, or research project involving human subjects. The QAPP shall address all elements listed in R-5.
- ☒ **Category II Project** - applicable to studies performed to generate data used in support of the development of environmental regulations or standards. The QAPP shall address all elements listed in R-5.
- ☐ **Category III Project** - applicable to projects involving applied research or technology evaluations. The QAPP shall address the applicable sections of R-5, as outlined in the NRMRL QAPP requirements for the specific project type.
- ☐ **Category IV Project** - applicable to projects involving basic research or preliminary data gathering activities. The QAPP shall address the applicable sections of R-5, as outlined in the NRMRL QAPP requirements for the specific project type.

**Suggested Content for Required Elements of QA Project Plans as per R-5:**

**GROUP A PROJECT MANAGEMENT**

There are nine elements in this group. These address project administrative functions and project concerns, goal(s), and approach(es) to be followed.

**Element A1- Title and Approval Sheet**

- Project title
- Organization name
- Names, titles, signatures, and signature dates of the approving officials

**Element A2- Table of Contents**

- Table of Contents;
- List of Figures, Tables, References and Appendices
- Document control format

**Element A3- Distribution List**

Names of individuals and organization(s) to receive a copy of the approved QA Project Plan

#### **Element A4- Project/Task Organization**

- List of individuals and organizations involved with the project, identifying their roles and responsibilities
- Documentation of project QA Manager's independence
- Identification of the individual responsible for maintaining the official, approved QA Project Plan
- Organizational chart showing relationships and lines of communication among project personnel

#### **Element A5- Problem Definition/Background**

- Statement of specific problem to be solved, decision to be made, or outcome to be achieved
- Background information

#### **Element A6- Project/Task Description**

- Summary of work to be performed and products
- Project schedule
- Maps, tables, etc. showing geographic locations

#### **Element A7- Quality Objectives and Criteria**

- Outputs from the systematic planning process (e.g., DQOs) used to design the study
- Measurement performance or acceptance criteria established as part of the study design. These relate the quality of data needed to the established limits on the chance of making a decision error or of incorrectly answering a study question

#### **Element A8- Special Training/Certifications**

- Description of how the most current approved QA Project Plan will be distributed to project staff
- List of records to be included in the data report package
- List of any other project documents to be produced
- Information on the final disposition of records and documents, including location and retention schedule

#### **Element A9- Documentation and Records**

- Any specialized training or certifications needed by personnel
- Plans for providing, documenting, and assuring this training

### **GROUP B: DATA GENERATION AND ACQUISITION**

The ten elements in this group address data generation and data acquisition and management activities.

#### **Element B1- Sampling Process Design (Experimental Design)**

Description of project's experimental design

#### **Element B2- Sampling Methods**

- Description of sample/data collection procedures
- List of equipment needed
- Identification of performance requirements
- Description of corrective actions to be taken if problems arise

#### **Element B3- Sample Handling and Custody**

Description of sample handling requirements and transfer, and for ultimate disposal

#### **Element B4- Analytical Methods**

- Description of analytical methods to be used
- Identification of any performance criteria
- Description of corrective actions when problems arise

#### **Element B5- Quality Control**

- List of QC activities needed for sampling, analytical, or measurement techniques, along with their frequency
- Description of control limits for each QC activity and corrective actions when these are exceeded
- Identification of any applicable statistics to be used

#### **Element B6- Instrument/Equipment Testing, Inspection, and Maintenance**

- List of equipment and/or systems needing periodic maintenance, testing, or inspection, and the schedule for such
- Description of how inspections and periodic preventive maintenance procedures will be performed and documented
- Discussion on how critical spare parts will be supplied and stocked
- Description of how re-inspections will be performed and effectiveness of corrective actions determined and documented

#### **Element B7- Instrument/Equipment Calibration and Frequency**

- List of all project tools, gauges, instruments, and other sampling, measuring, and test equipment which should be calibrated
- Description of calibration method and identification of any certified equipment and/or standards to be used
- Details of how calibration records will be maintained and traceable to the instrument/equipment

#### **Element B8- Inspection/Acceptance of Supplies and Consumables**

- A list of project supplies and consumables that may directly or indirectly affect the quality of the results
- The acceptance criteria for them
- Identification of those responsible

#### **Element B9- Non-direct Measurements**

- Identification of any existing data that will be obtained from non-measurement sources, such as literature files and historical databases
- Description of how you intend to use the data
- Your acceptance criteria and any limitations for using such data

#### **Element B10- Data Management**

- Description of the project data management process
- Description of or reference to the office's standard record-keeping procedures and document control, data storage, retrieval, and security systems
- Identification of data handling equipment and procedures to process, compile, and analyze project data
- Discussion of data handling procedures to detect and correct errors and loss during data processing
- Examples of any forms or checklists to be used

- Identification of any specific computer hardware/software performance requirements and how configuration acceptability will be determined
- Description of how applicable information resource management requirements will be satisfied, as well as any applicable Agency information resource management requirements (EPA Directive 2100, EPA QA Project Plans only)

## **GROUP C: ASSESSMENT AND OVERSIGHT**

Assessments or evaluations are designed to determine whether the QA Project Plan is being implemented as approved (conformance/nonconformance), to increase confidence in the information obtained, and ultimately to determine whether the information may be used for their intended purpose. The two elements in this group detail what assessments or evaluations will occur both during and after the project. Data assessments, such as data verification and validation, are discussed in the Group D elements.

### **Element C1- Assessments and Response Actions**

- Description of project assessments planned and a brief discussion of the information expected
- Approximate schedule for these assessments and their reports
- For any planned self-assessments, identification of potential participants and their relationship within the project organization
- For independent assessments, identification of the organization and person(s) that will conduct the assessments
- Identification of how, when, and to whom the results of each assessment will be reported and corrective actions implemented

### **Element C2- Reports to Management**

- Frequency and distribution of reports to inform management (EPA or otherwise) of the project's status
- Identification of report preparer and recipients, as well as any specific actions or recommendations recipients are expected to make

## **GROUP D: DATA VALIDATION AND USABILITY**

The three elements in this group address the final project checks to see if the data or product obtained will conform to the project's objectives, and to estimate the effect of any deviations. For projects that use existing data, these elements focus on evaluating how data values from these acquired data sets will be used to determine the quality objectives for the new data use. For a modeling project, this process is similar to confirming that the steps in the modeling process were followed correctly to produce the model outputs and that the results meet project objectives.

### **Element D1- Data Review, Verification, and Validation**

State the criteria for deciding to accept, reject, or qualify project data in an objective and consistent manner

### **Element D2- Verification and Validation Methods**

- Description of how project data will be verified and validated
- Discussion of how any issues will be resolved and identification of who has the authority for resolving them
- Description of how results will be conveyed to data users
- Explanation of how validation issues differ from verification issues for this project
- Examples of any forms or checklists to be used and identification of any project-specific calculations

### **Element D3- Reconciliation with User Requirements**

- Description of how project results will be reconciled with the requirements defined by the data user or decision maker
- An outline of methods proposed to analyze the data and determine possible anomalies or departures from assumptions made when the project was planned
- Description of how reconciliation with user requirements will be documented, issues will be resolved, and how limitations on the use of the data will be reported to decision makers